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Indian Standard

METHODS OF GRADING AND VISUAL CLASSIFICATION OF MUSCOVITE MICA SPLITTINGS

UDC 621·315·613·1 : 620·1

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

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Price Group 2

Solid Electrical Insulating Materials Sectional Committee, ETD 2

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Solid Electrical Insulating Materials Sectional Committee had been approved by the Electrotechnical Division Council.

For many years Indian mica producers have adopted a uniform system of size grading for muscovite mica. The Indian system has been adopted by various other countries, such as USA, Canada, Brazil, South Africa, and has been generally used in international trade.

A draft International Standard, based on the Indian system, has been prepared in 1977 after taking due account of the requirements of users of muscovite mica splitting all over the world. It is complementary to ISO standard 67 Muscovite mica blocks, thins and films methods for grading by size which deals with the methods for grading by size muscovite mica blocks, thins and films as also to IS 1175 : 1957 'Methods for grading and classification of muscovite mica blocks, thins and films.

In the preparation of this standard, considerable assistance has been derived from the following:

ASTM : D2131 'Specifications for National Muscovite Mica Splitting'. American Society for Testing and Materials (ASTM).

Indian Standard

METHODS OF GRADING AND VISUAL CLASSIFICATION OF MUSCOVITE MICA SPLITTINGS

1 SCOPE

This standard covers the methods of size classification of muscovite mica splittings by standard commercial grades and specifies the maximum allowable physical defects for each grade. It is applicable to commercially available natural muscovite mica splittings, irrespective of the basic colour of the mica or its source.

2 REFERENCES

IS 1175 : 1957 'Methods for grading and classifications of muscovite mica blocks, thins and films' is a necessary adjunct to this standard.

3 DEFINITIONS

3.0 For the purpose of this standard, the following definitions shall apply.

3.1 Rough or Burred Edge

A frayed or serrated edge usually 0·8 mm deep or greater, or an edge turned up or down as caused by trimming with scissors, etc, or by rubbing the edge against sandpaper, stone, etc.

3.2 Stains

Discolouration arising from foreign materials, resulting in a partial or total loss of transparency, and which may be in the form of specks or patches of appreciable area, for example, slight stain, vegetable stain, clay stain, black stain, red stain, black speckled, light dot or spot black, red or green dot or spot, etc.

NOTES

1 The so-called 'vegetable' stains are of pale yellow brown, green or clay colour when viewed by transmitted light.

2 Mineral stains are distinctly black, red, brown or green when viewed by transmitted light.

3 No data are available to support the impression that the 'vegetable' stains are organic in nature. Tests conducted indicate that they are finely dispersed particles of the various iron oxides. The difference between these stains and the so-called mineral stains is probably only in their concentration or type of oxide.

3.3 Stained Splitting

Splitting that contains a single mineral dot or when the cumulative area of vegetable and clay stains exceed 6.4 mm^2.

3.4 Tear, Fracture and Peripheral Hole

A tear or fracture extending from the periphery more than the following distances:

Grade Designation		*Distance*
New Grade No.	Old Grade No.	mm
63	3	15·9
40	4	12·7
20	5	9·5
16·06	5½-6	6·4

3.5 Hole

A perforation, sometimes minute, through the laminae.

3.6 Thick Edge

Splittings shall be considered to have a thick edge if the edge or end in question is more than 1·5 times the minimum thickness measured at any point on the splitting or if the thickness of the edge or end exceeds the maximum average thickness allowed for the grade of splittings. This defect may be due to the nature of the mica used for the effect of splitting.

3.7 Thick Splitting

A bookform splitting whose thickness in the major section of its area or over the entire area exceeds the maximum average thickness for the grade of splitting. Loose with powder splittings shall be considered thick only if such thickness exceeds 0·025 mm. Loose splittings shall be considered thick only if, such thickness exceeds 0·030 mm.

3.8 Thin Splitting

A splitting whose thickness in the major section of its area is less than the minimum average for the grade of splittings.

3.9 V Cut

A cut or trim into the splitting roughly shaped as a 'V'. A splitting shall be considered V cut if it contains an indentation having an included angle of 120° or less extending from the periphery more than the following distances:

Grade Designation		*Distance*
New Grade No.	Old Grade No.	mm
63	3	15·9
40	4	12·7
20	5	9·5
16·06	5½-6	6·4

3.10 Waviness

One or a series of elevations or depressions or both, which are readily noticeable and which includes defects, such as buckles, ridges, etc.

4 PHYSICAL REQUIREMENTS

4.1 Size

4.1.1 Natural muscovite mica splittings shall meet the size requirement specified in Table 1.

4.2 Total Defects

4.2.1 Muscovite mica splittings shall not have more than the maximum allowable total defects specified in Table 2 based on percentage mass, such defects shall not lie predominantly in any category.

4.3 Individual Defects

4.3.1 Muscovite mica splittings shall not have more than any single defect than the percentage specified where a specific percentage is allowed for such defect.

5 SAMPLING

5.1 Bookform

5.1.1 Fifty books shall be drawn at random from each case sampled. At least 10 percent of the cases in the lot shall be sampled.

5.2 Dust Loose and Loose

5.2.1 A minimum of a 28 g sample from each case sampled shall be taken. At least 10 percent of the cases in the lot shall be sampled.

5.3 Method of Calculation

5.3.1 Splittings shall be examined for defects in the order of separate values listed and counted defective for the first defective characteristics noted. Defects for which separate values are not given may be aggregated. Each group shall be weighed to determine the percentage it represents of the total sample mass less undersizes (*see* Note marked 'a' under Table 2). In computing percentages, 0·5 percent or more shall be considered 1 percent, less than 0·5 percent shall be considered 0.

Table 1 Requirements for Size and Average Thickness of Splittings

(*Clause* 4.1.1)

Grade Designation		Form	Size	Minimum Dimension of Usable Rectangle	Thickness of ten Splittings
New Grade No. (1)	Old Grade No. (2)	(3)	(4) (cm^2)	(5) (cm)	(6) (mm)
63	3	Bookform	64·5 to 96·8 excl.	5·1	0·15 to 0·23*
40	4	Bookform	38·7 to 64·5 excl.	3·8	0·15 to 0·23*
20	5	Bookform	19·4 to 38·7 excl.	2·5	0·15 to 0·23*
16	5·1/2	Bookform	12·9 to 19.4 excl.	2·2	0·15 to 0·23*
06	6	Bookform	6·5 to 18·9 excl.	1·9	0·15 to 0·25*
63	3	Loose with powder	64·5 to 96·8	5·1	0·15 to 0·23*
40	4	Loose with powder	38·7 to 64·5 excl.	3·8	0·15 to 0·23
20	5	Loose with powder	19·4 to 38·7 excl.	2·5	0·15 to 0·23
16	5·1/2	Loose with powder	9·7 to 19·4 excl.	2·2	0·18 to 0·25
06	6	Loose with powder	At least 80 percent shall be 6·5 to 9·7 excl.†	1·9	0·18 to 0·25
06-1	6-1st	Loose	At least 70 percent shall be 6·5 to 9·7 excl. Not more than 3 percent shall pass through a screen having 19·05 mm square openings.	—	0·18 to 0·25
06-i	6 Intermediate	Loose	At least 60 percent shall be 6·5 to 9·7 excl. and at least 25 percent shall be 4·5 to 6·5. Not more than 3 percent shall pass through a screen having 15·9 mm square openings.	—	0·18 to 0·25
06-2	6-2nd	Loose	At least 50 percent shall be 6·5 to 9·7 excl. Not more than 5 percent shall pass through a screen having 15·9 mm square openings	—	0·18 to 0·28
06-3	6-3rd	Loose	At least 65 percent shall have a minimum area of 4·8 cm. Not more than 8 percent shall pass through a screen having 15·9 mm square openings	—	0·18 to 0·28
06-4	6-4th	Loose	At least 30 percent shall have a usable area of 3·2 mm^2 and nothing shall pass through a screen having 6·35 mm square openings	—	0·18 to 0·31

NOTES

1 Splittings should not be of minimum area specified but should contain a fair proportion of sizes throughout the range specified.

2 The area specified do not refer to the total area of the splittings but to the rectangular size which each grade will produce. For example, grade (20 odd grade 5) splittings should be large enough to provide rectangular pieces measuring 3·8 cm × 5·1 cm, 5.1 cm × 5·1 cm, 5·1 cm × 5·9 etc.

† Upon agreement between the supplier and purchaser the minimum area may be 9·7 cm^2.

* Minimum and maximum thickness of a single splitting in case of bookform splittings shall be as agreed to between the supplier and the purchaser.

Table 2 Defects

(*Clauses* 4.2.1 *and* 5.3.1)

Grade Designation		Form	Undersize (a) Percent	Stain (b) Percent	Waviness	Tears, Fractures and Holes	Thick Splittings Percent	Thin Splittings	V Cut	Rough or Burred Edges	Other Defects	Total Allowable Defects, Percent	Maximum Allowable Individual Defects, Percent
New Grade No.	Old Grade No.												
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
63	3	Bookform	5	d	d	d,e	d	d	d	d,f	d	15	4
40	4	Bookform	5	d	d	d,e	d	d	d	d,f	d	15	4
20	5	Bookform	5	d	d	d,e	d	d	d	d,f	d	15	4
16	5	Bookform	5	d	d	d,e	d	d	d	d,f	d	15	4
06	6	Bookform	5	d	d	d,e	d	d	d	d,f	d	15	5
63	3	Loose with powder	15	d	d	d	d	d	d	d,g	d	25	7
40	4	Loose with powder	15	d	d	d	d	d	d	d,g	d	25	7
20	5	Loose with powder	15	d	d	d	d	d	d	d,g	d	25	7
16	5·1/2	Loose with powder	15	d	d	d	d	d	d	d,g	d	25	7
06	6	Loose with powder	j	d	d	d	d	h	h	d,g	d	20	7
06-1	6	1 st loose	j	12			3					20	
06-i	6	intermediate loose	j	16			3					20	
06-2	6	2nd loose	j	20			4					20	
06-3	6-3rd	Loose	j	20			5					20	
06-4	6-4th	Loose	j	16			8					20	

a) This percentage not to be included with total allowable defects.

b) Lots that contain more than 2 percent of stained splittings in which the sum of the major dimensions of the stains exceeds 6·4 mm shall not be regarded as meeting these standards. No mineral stain shall be permitted in bookform splittings. Not more than 30 percent of the stain in grade 40, 20 and 16 (old grades 4, 5, 5.1/2) loose with power shall be mineral stain. Not more than 40 percent of the stain in grade 06, 06-1, 06-i, 06-2, 06-3 and 06-4 (old grade 6 loose with powder, 6-1st, 6-intermediate, 6-2nd, 6-3rd and 6-4rd loose) shall be mineral stain.

c) To include an evaluation of undersize splittings for other defects.

d) Examine for the defects listed.

e) No hole shall be permitted.

f) Count as a defect if more than 20 percent of the periphery is rough or burred.

g) Same as footnote (f), except that limit is 35 percent.

h) Do not examine for the defect listed.

j) Determine undersize in accordance with Table 1.

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